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PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in Chewing Gum and the Methods of Making the Same.

I, GILBERT BARKLAY MUSTIN, a citizen of the United States of America, residing at Herford Place, Lansdowne, County of Delaware, State of Pennsylvania, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Heretofore difficulty has been experienced in making chewing gum, strong in flavor and pleasant to the taste, because the masticable material does not readily absorb very much of the flavoring material. It is only by using a relatively large quantity of a flavoring material of high concentration that a satisfactory flavor can be imparted to the gum.

Nor can the quality of the flavor of ordinary chewing gum be substantially increased or improved by increasing the concentration or the quantity of flavoring material substantially over that ordinarily used in making commercial chewing gum, for the organs of taste are unaccustomed to these strong, more concentrated flavors, and a consumer might not recognize the flavor or might even find it unpleasant.

Moreover, while the insoluble masticable content of chewing gum is nearly tasteless, it does in fact possess susceptible taste, and the taste of the flavoring extract or solution mingled with the natural taste of the insoluble portion of the gum, may be substantially different from that associated with a particular flavor, because the gum chewer invariably compares the taste of the flavor of the gum with that of the same flavor in sugar or confectionery.

Sugar or sugar confectionery will absorb and retain almost any flavor and the flavor of confectionery is readily recognized as being that which the consumer regards to be the true flavor, although to impart that flavor to confectionery requires a much smaller amount of flavoring material and of a lower concentration than that required to impart a much less pronounced flavor to the masticable portion of chewing gum.

One object of my invention is to pro-  
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duce a chewing gum having a fuller, stronger, richer flavor than that obtainable by the use of ordinary methods of making chewing gums and with a smaller quantity of flavoring material of lower concentration.

In the manufacture of ordinary chewing gum the insoluble content constitutes from 18% to 30% of the volume of the gum and the actual sugar content of a single strip or bar of gum and by which substantially all of the flavor is retained, is relatively small. Moreover, the ordinary chewing gum is quite hydroscopic so that unless the gum is carefully protected from the atmosphere by tin foil or other waterproofing, it is likely to "sweat". Sugar confectionery, consisting of a dough-like mass of powdered sugar, flavoring and a binding gum, such as gum arabic or gum tragacanth, is not hydroscopic or deliquescent. Such material is commonly called and referred to hereinafter as lozenge dough or lozenge confectionery and can be kneaded, moulded and shaped but when dry is normally hard and brittle. It is an uncooked mass as distinguished from those candies which are cooked and in which the sugar is crystalline.

It is a further object of this invention to provide individual pieces of chewing gum in the form of thin rectangular strips capable of being wrapped in packages of four or five, each strip being substantially three-thirtyseconds of an inch thick and comprising a thin core of masticable gum having its opposite sides coated with a thin ply of normally brittle lozenge confectionery which will retain almost any flavor independently and which will impart to the gum, when masticated, the full natural taste which is always associated by the user with confectionery or sugar when flavored with like flavoring material.

A further object of my invention is to protect the hydroscopic insoluble content of a strip of chewing gum from atmospheric contact, by providing the opposite flat surfaces thereof respectively with a thin layer or coating of smooth, non-

gritty, non-crystalline, non-hydroscopic lozenge confectionery, containing any desired flavor.

A further object of my invention is to provide a three-ply bar of chewing gum of the size of an ordinary one-ply strip of chewing gum which shall contain substantially the same amount of insoluble content as that now contained in the ordinary strip of chewing gum of the size of my improved three-ply bar.

A further object of my invention is to produce a piece of chewing gum wherein the masticable insoluble ingredients are in one layer or ply of the finished piece of gum and the main or substantial flavor for the piece of gum is in two plies or layers of a creamy non-crystalline, lozenge confectionery, unitarily and inseparably united to the first-mentioned layer.

A further object of my invention is to produce a piece of chewing gum or process of making the same, wherein the layer of chewing gum of good quality, is firmly and inseparably united to two plies of non-crystalline, smooth, non-hydroscopic flavored lozenge confectionery and in which the mixture of the layers at the planes of contact is so intimate to the confectionery layers, normally brittle when dry, are substantially changed and remain slightly flexible and will not break if cracked off, flake off, or chip off, or separate from the masticable layer when the piece of gum, as a whole, is broken or severed.

A further object of my invention is to provide a method of making a laminated base sheet which may be subdivided in a variety of ways, to form individual strips, sticks, pillows, drop or flat pieces, all composed of a layer of chewing gum proper and one or more layers of smooth non-crystalline, grit-free flavored lozenge confectionery, inseparably united thereto.

According to the invention an individual piece of chewing gum is composed of a thin ply or layer of masticable material interposed between and pressed hard into contact with two thin flexible plies or layers of lozenge dough or lozenge confectionery, whereby material of the inner layer penetrates slightly into the material of the outer layers and the lozenge material takes on the flexible characteristic of the gum, while the main flavor for the chewing gum is in said layers of lozenge material.

In the accompanying drawings:—

Figure 1 indicates, in plan view, two relatively large thick sheets of flavored lozenge dough and one similar large thick sheet of chewing gum, of good quality, said thick sheets being formed in any suitable convenient manner.

Figure 2 is a fragmentary vertical cross sectional view of a thick three-ply composite sheet wherein the intermediate ply is chewing gum material and the outer plies are lozenge dough.

Figure 3 is a diagrammatic illustration, in vertical cross-section, of the manner in which the three-ply sheet of Fig. 2 is reduced in thickness by a rolling operation and illustrating how the relative proportional thickness of the plies is maintained.

Fig. 4 is a view similar to Fig. 3 showing a continuation of the rolling step.

Fig. 5 is a side elevational view of what is herein termed a laminated plastic ductile base from which individual pieces of chewing gum may be produced by the continued rolling of the composite sheet down to the thickness desired in the completed piece of gum.

Fig. 6 is a plan view on a reduced scale, of a portion of a sheet shown in Fig. 5, deeply scored to form a large number of smaller individual strips which may be readily broken away from the main sheet when cool.

Fig. 7 is a fragmentary sectional view, on a larger scale than Fig. 6, showing the base sheet provided with the deep scorings which are indicated by lines in Fig. 6 and showing how the ends of the intermediate ply are substantially covered with lozenge material.

Fig. 8 is a perspective view of the finished pieces of gum made in accordance with my invention.

Fig. 9 is a perspective view of a package of five strips or bars of my improved chewing gum, each bar individually wrapped and the whole five bound together by an outer band in the manner in which chewing gum is ordinarily packaged for sale.

Fig. 10 is a diagrammatic illustration of the manner in which a relatively narrow strip, severed from the opposite sheet may be passed through a series of pairs of rollers to reduce the thickness of the composite sheet and of the various plies.

Fig. 11 is a diagrammatic view showing how a relatively thick narrow strip delivered from the mechanism shown in Fig. 10 may be scored and subdivided into "pillows".

Fig. 12 is a longitudinal sectional view showing the strip of Fig. 11 after scoring, and

Fig. 13 is a plan view of the same.

Figs. 14 and 15 are respectively sectional and elevational views of another manner of making pillows or tablets by passing the base sheet between rollers

provided with a series of recesses having tapering walls, the recesses in one roller being in registration with those in the other roller when the rollers are rotated.

Fig. 16 is a plan view of a finished piece of gum produced by the mechanism of Figs. 11 and 14 and separated from the main sheet at the scorings.

Fig. 17 is a side elevational view showing how the inner ply of chewing gum is completely enclosed by the lozenge material.

Fig. 18 is a similar cross-sectional view taken on the line 19—19 of Fig. 16.

Figs. 19 and 20 are respectively vertical sectional and rear elevational views of a portion of a pair of coating grooved rollers arranged to divide the laminated sheet into a plurality of rods or pencils.

Fig. 21 is a side elevational view of a rod produced by the mechanism of Figs. 19 and 20 and showing how the rod is divided by scores into pencils of appropriate length; and

Fig. 22 is a cross-sectional view of the finished pencil with a gum core, the view being taken on line 23—23 of Fig. 21.

In making my improved piece of chewing gum, I preferably first prepare two plastic masses or batches 1—1, of smooth creamy non-crystalline plastic flavored lozenge dough, the ductility of which is not substantially changed by variations in temperature between 80° and 150° F. I also prepare a similar mass or batch 2 of chewing gum which may be like that usually employed in commercial chewing gum of good quality, the ductility of which increases as the temperature rises and which is readily rolled and worked between the temperatures of 85° and 150° F. The batch 2 of chewing gum is preferably, but not necessarily, flavored with the same flavoring material as that employed in the lozenge dough, for one of the objects of this invention is to produce a chewing gum having practically any of the flavors available to makers of confectionery.

The temperature of the batch of chewing gum is brought to a point whereat its plasticity and ductility are substantially like that of the lozenge dough and after the batches are rolled out in thick sheets 1—1 and 2 of substantially equal thinness.

To make a three-ply piece of chewing gum, wherein the gum is covered on both sides by the confectionery to protect the gum from the atmosphere, one thick sheet of gum material 2 is placed upon a thick sheet 1 of lozenge dough and upon the sheet 2 a second sheet 1 of lozenge dough is placed, thus making the thick composite three-ply sheet 3.

While these layers or plies 3 or 5 are warm, and their ductility is substantially like that of the layer of lozenge material 1, I progressively roll out this thick composite sheet by any suitable rolling means, as by a roller 4 shown in Figs. 3 and 4, operated by hand or machine, into a thin composite base sheet 5 (see Fig. 5).

Fig. 4 illustrates a continuation of the rolling step shown in Fig. 3 and how the thickness of the composite sheet is further reduced in bringing the sheet down to the thickness or thinness of the base sheet 5. Because the ductility of the materials constituting these plies 1 and 2 is the same the thickness of the plies are proportionally reduced by the rolling of the composite sheet.

While this base sheet 5 is in a soft pliable condition, it is preferably provided, by hand or machine, with the scorings 6—6 at right angles to each other, dividing the base sheet 5 into a large number of like individual pieces 7 connected together by a thin web, as shown on an enlarged scale in Fig. 7. When the scored sheet is cool, the individual pieces 7 may be readily snapped from the main sheet and packaged in any desired manner.

The rolling action to which the layers 1 and 2 are subjected, produce a very firm union of the plies 1 to the ply or layer 2 of gum and the material of one ply appears to flow into and mix slightly with the material of the adjacent ply at the plane of their contact, so that there is no absolute clean line of demarcation or cleavage between the two plies. The plies cannot be pried apart or separated as plies from each other.

Moreover, this rolling action and the intimate contact of the plies appear to effect the transference of some of the moisture and gummy or oily contents of the intermediate ply 2 of gum into the contacting layer or layers 1 of lozenge material, with the result that the physical properties of the outer plies of lozenge material are substantially changed. Instead of being brittle and frangible, as lozenge confectionery normally is upon drying, the outer plies 1 of my improved piece of gum remain creamy to the taste, but dry and non-tacky to the touch and quite pliable, so that when a piece of my laminated chewing gum is broken or severed or slightly bent, the lozenge material does not crackle or snap or chip or breakaway or break back from the point of severance free from the layer of gum, but remains as an intact layer of the piece of gum up to the very point of severance or break.

I may reduce the thickness of the composite sheet shown in Fig. 2 to a laminated base, such as is shown in Fig. 4 and wherein the total thickness of the finished piece 7 of gum, shown in Fig. 8, is only about three-thirtyseconds of an inch, which is less than the thickness of a flat rectangular piece of chewing gum as commonly packaged and placed on the market. The flat pieces 7 of chewing gum are preferably each wrapped in a cover 8 of paper or foil and are packaged in packs 9 of five strips with a paper band or cover 10 holding the pieces together in the usual manner.

But it is not essential to the invention that the base 5 be rolled so thin as is shown in Figs. 8 and 9, for in several forms of my invention, the thickness of all the plies in the finished sheet of chewing gum is much greater and may be one-fourth of an inch or more.

When, however, the quantity of chewing gum in an individual piece of my improved gum is substantially less than that contained in an ordinary piece of gum of the same size, I preferably increase the insoluble content of my layer 2 of chewing gum, so that the volume of the insoluble residue left in the mouth will approximate that which is left in chewing a piece of ordinary gum. Except for this feature, the chewing gum which I use for the layer 2 of my improved piece of chewing gum, is substantially like that of present day commercial chewing gum of good quality with respect to the chicle, glucose, sugar and flavoring contents.

In Figs. 10 to 13 is diagrammatically shown a modified method wherein I provide three sets of coating rollers 4<sup>a</sup>—4<sup>b</sup> between which a narrow strip 3<sup>b</sup> from the composite sheet 3 may be progressively reduced in thickness without spreading it laterally. One roller (e.g. 4<sup>b</sup>) of each pair of rollers is preferably provided with a pair of flanges 11 to prevent any lateral flow of the material as it passes between the sets of rollers. The base strip 5<sup>a</sup>, so formed and which is relatively thick, but narrow in width, may be provided with scoring 6 at suitable intervals with scoring knives or edges 12—12, indicated in Fig. 11.

When so scored, the individual piece may be in the form of pillows or cushions connected by a thin web 13 of unsevered material. When cold, these pieces 7<sup>a</sup> may be broken apart and packed in cartons, or the scored pieces may be packaged in suitable lengths and the individual pillows 7<sup>a</sup> may be broken off as one consumes the bar or stick of gum.

In Fig. 14 is disclosed a further modification wherein the composite base 5 is

passed between a pair of rollers 4<sup>c</sup>, 4<sup>d</sup> mounted to rotate on parallel axes, each cylinder or roller having in its surface a series of recesses 14 adapted to be brought into registration as the rollers rotate in the direction of the arrows, Fig. 13. The walls of these recesses are preferably tapering outwardly so that the pieces molded therein will not firmly adhere thereto. Because the outer edges of the recesses 14 of the rollers are substantially in contact, they form knives 12<sup>a</sup>—12<sup>b</sup> for tubularly scoring or nearly severing the individual pieces 7<sup>a</sup> of gum formed in the recesses 14. Each piece of gum 7<sup>a</sup> will be of the "pillow" or "cushion" shape. The tapered side walls 14 will force the material of the layers 1—1 down the sides and ends of an individual piece 7<sup>a</sup> of gum so that the masticable layer 2 is completely encased in a coating 1<sup>a</sup> of lozenge confectionery, as shown in Figs. 16, 17, 18 and 22.

In Figs. 19 and 20, are illustrated modifications wherein the laminated base sheet 5 is passed between a pair of coating rollers 4<sup>e</sup> and 4<sup>f</sup> each having a series of circumferential grooves 14<sup>a</sup> substantially semicircular in cross-section. The edges 12<sup>a</sup> of these grooves 14<sup>a</sup> are preferably in contact or close. Sharp transverse edges 12<sup>b</sup> in the grooves 14<sup>a</sup> cut the pencils 7<sup>b</sup> formed in the grooves 14<sup>a</sup> into suitable lengths. The open spaces between the rollers 4<sup>e</sup> and 4<sup>f</sup> are substantially circular. When the composite sheet 5 passes between these rollers, it is first divided into strips 5<sup>a</sup> by the knives 12<sup>a</sup> and then is molded into cylindrical pencils 7<sup>b</sup> each having a core of gum surrounded by a layer 1 of lozenge dough tightly pressed against the core so that the coating will be slightly penetrated by the gum content of the layer 2 and the confectionery, when dry, will be smooth, slightly flexible and will not chip or break away from the core when the piece is severed or crushed. This coating will not feel gritty or gravelly or crisp in the mouth or separate from the core. The pencils provided with the scoring 6 may be broken apart when cool and packaged in any suitable manner. To make certain that the core 2 of the pencils 7<sup>b</sup> is completely surrounded by the coating 1<sup>a</sup> the pencil may be manually rolled over a smooth hard surface, while warm, thereby flowing the dough circumferentially of the pencil and covering any exposed edge of the core where it was severed from the multiple ply base 5. Fig. 22 shows the core 2 so completely covered.

As the pieces are made of three plies, the individual pieces 7—7<sup>a</sup>—7<sup>b</sup> will be

substantially covered on all sides with a surfacing of lozenge confection which is not hygroscopic or deliquescent and which protects the hygroscopic layer 2 of gum from contact with the atmosphere. These pieces may not require a wrapping of foil or paper except to keep the product clean.

In all the methods above described, the base is a composite sheet 5 or strip 5<sup>a</sup> having three plies, one of chewing gum and the two other plies of lozenge confectionery inseparately united thereto with the material of one layer forced into the material of the other layer. The lozenge confectionery will have flexibility, smoothness and creaminess which that material would not have were it not so associated with the layer of gum.

This invention is not to be confused with those chewing gums often in the form of pillows or cushions, made by rolling the pieces of gum in a warm pan containing melted sugar which accumulates on and covers the gum as almonds are covered with a coating of sugar. Such candy coatings are not soft like chewing gum, but brittle, crystalline and gritty. The pieces crackle like crystalline sugar in the mouth and break away from the gum. In chewing a piece of gum embodying the present invention, the lozenge confectionery is of the consistency of the gum, does not break away from the gum during the mastication thereof but works smoothly into the gum, imparting to the gum the full strong natural flavor carried by the lozenge confection.

Because this lozenge confectionery will retain flavors which cannot be imparted to chewing gum made in the ordinary way, I am able to greatly increase the variety of flavors for chewing gums and to produce in the gum the taste and flavor obtainable in confectionery or sugar. By flavoring the masticable gum like the coating, the product has the full, well recognized taste of the flavor that confectionery has, and when all of the confection has been dissolved there will still remain the fainter flavor found in ordinary chewing gum.

Moreover, the particular flavor of a piece of chewing gum embodying my invention may be indicated by the colors usually employed by candy makers to conventionally indicate a particular flavor. The coating may be green to indicate mint, or red for wintergreen, so that the purchaser may readily select the flavor desired by the distinctive identifying color of the piece itself. A variety of colors may be employed to add to the attractive appearance of the product.

Having now particularly described and

ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An individual piece of chewing gum composed of a thin ply or layer of masticable material interposed between and pressed hard into contact with two thin flexible plies or layers of lozenge dough or lozenge confectionery, whereby material of the inner layer penetrates slightly into the material of the outer layers and the lozenge material takes on the flexible characteristic of the gum, while the main flavor for the chewing gum is in said layers of lozenge material.

2. An individual piece of chewing gum according to claim 1 in which the intermediate ply has a relatively high insoluble content.

3. An individual piece of chewing gum according to claims 1 and 2, wherein the two outer plies are composed of lozenge confectionery which is normally brittle when dry, but which remains flexible when united to said intermediate layer.

4. An individual piece of chewing gum according to claim 1 in which a masticable core of chewing gum material has a coating of said lozenge material enclosing said core.

5. A method of making chewing gum which consists in rolling a batch of masticable material and a batch of lozenge confectionery separately into relatively thick sheets, interposing a relatively thick sheet of said chewing gum material between two similarly thick sheets of said lozenge dough, rolling the thick three-ply composite sheet so formed, thinner and thinner until the thickness of the plastic three-ply base sheet so formed, is substantially that of an ordinary individual strip of chewing gum, thereby forcing the material of each ply slightly into the material of the adjacent ply at the planes of their contact with each other, scoring said plastic base sheet into three-ply rectangular strips, each of the size and shape of an ordinary flat strip of chewing gum, and then allowing said scored base sheet to cool, said plies of lozenge dough being so intimately and permanently united to said ply of chewing gum material that they are flexible, when cool and dry, and do not chip off, or break away or separate from said ply of chewing gum material when the piece of chewing gum, so made, is broken, or severed, or masticated.

6. A method of making chewing gum according to claim 5, wherein the rolling takes place at a temperature at which the ductility of the masticable material, which varies with the temperature and

increases as the temperature raises, is substantially the same as that of the outer plies of lozenge confectionery, the plasticity and ductility of which is not substantially changed by variations in temperature.

- 5 7. A method of making chewing gum according to claim 5, in which said three plies are of substantially equal thickness.
- 10 8. A method of making chewing gum according to claim 5, in which the finished piece of chewing gum is severed or broken and then molding said laminate base sheet into a plurality of small like individual pieces and simultaneously forcing

the confectionery dough of said upper and lower plies around the side and end edges of each individual molded piece to enclose the ply of chewing gum within said confectionery material.

9. An individual piece of chewing gum substantially as shown, described and for the purpose set forth.

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Dated this 17th day of July, 1930.  
FRANCIS HERON ROGERS,  
Agent for Applicant,  
Bridge House,  
181, Queen Victoria Street,  
London, E.C.4.

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Fig. 1.

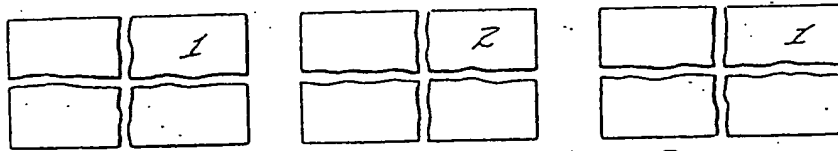


Fig. 2.

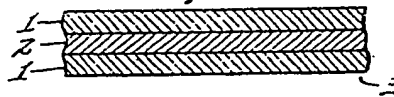


Fig. 3.

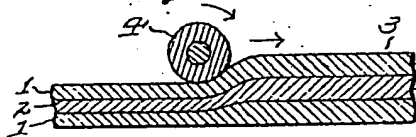


Fig. 4.

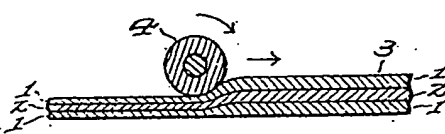


Fig. 5.

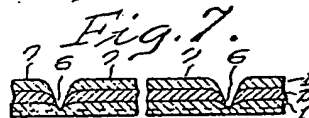
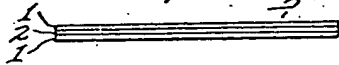


Fig. 6.



Fig. 8.

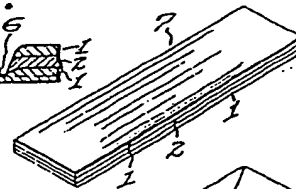


Fig. 9.

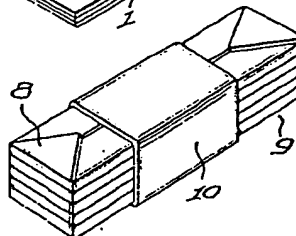
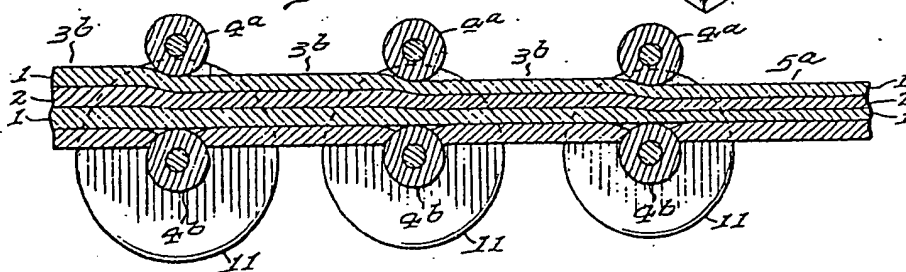
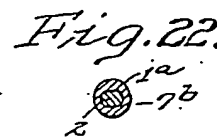
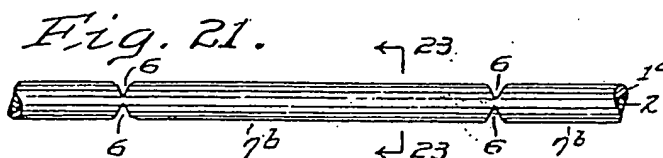
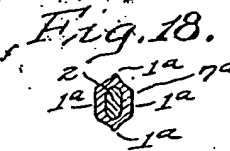
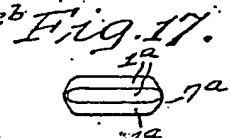
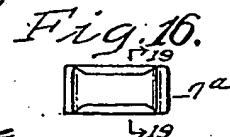
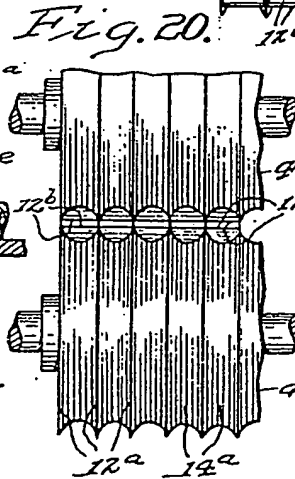
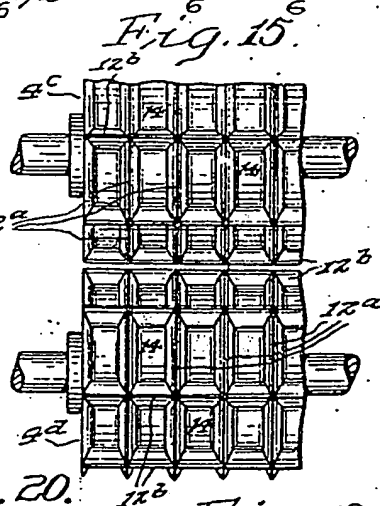
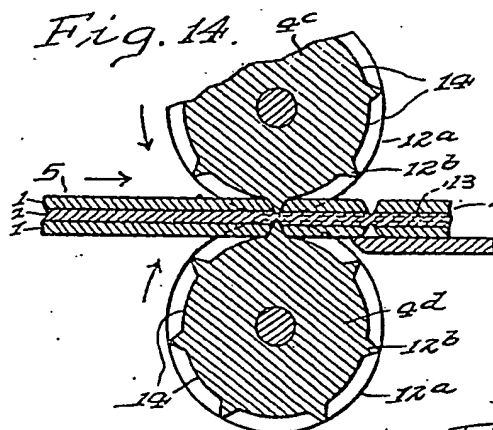
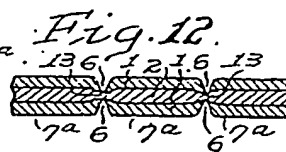
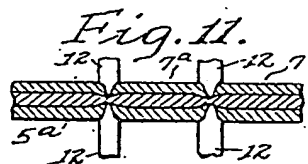


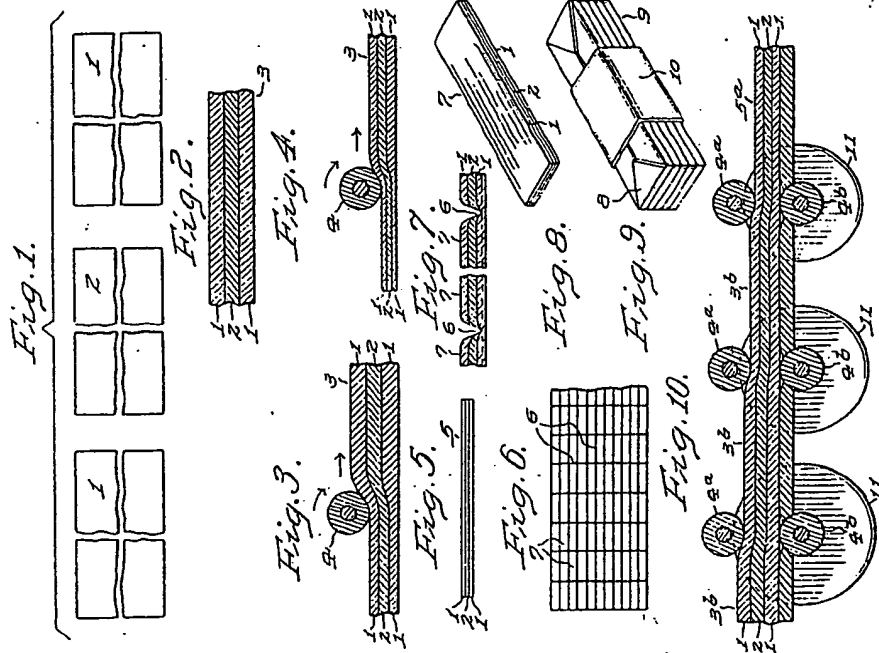
Fig. 10.



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